

PD NON-FICTION

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"Green Beetle with Brown Legs" by Jan Vincentsz van der Vinne (Dutch, Haarlem 1663–1721 Haarlem)
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Francis Hopkinson

NEW JERSEY

The literary and artistic talents of this versatile signer brought him more acclaim than his political and legal activities. Although a lawyer and judge by profession, he achieved more eminence as an essayist, poet, artist, and musician. His verse and satirical essays rank among the better literary efforts of the Revolutionary and early Federal periods, and he was one of America's first native composers. His eldest son, Joseph (1770–1842), wrote "Hail Columbia" and won distinction as a lawyer, jurist, U.S. Congressman, and patron of the arts.

Hopkinson was born at Philadelphia in 1737, the eldest of eight children. His father, who died when he was 14, was a prominent lawyer-jurist, politician, and civic leader. Upon graduation from the College of Philadelphia (later part of the University of Pennsylvania) in 1757, young Hopkinson studied law under Benjamin Chew, attorney general of the province, and 4 years later joined the bar. In 1763 he obtained the position of customs collector at Salem, N.J. Three years hence, after failing in business, he sailed to England to seek an appointment as colonial customs collector through the influence of friends and relatives. During his yearlong stay, though unsuccessful in his vocational quest, he visited Benjamin Franklin, Lord North, and other prominent people, and may have studied under artist Benjamin West.

Back in Philadelphia, Hopkinson operated a store and married in 1768. Four years later he became the customs collector at New Castle, Del. About 1774 he took up residence at the home of his father-in-law in Bordentown, N.J., practiced law, and began a 2-year tour in the legislature. As a Member of the Continental Congress for only a few months in 1776, he relieved his ennui by drawing caricatures of his colleagues. His later offices included: chairman (1777–78) of Philadelphia's Continental Navy Board, treasurer of loans (1778–81), judge of the admiralty court of Pennsylvania (1779), and Federal circuit judge for the eastern district of the State (1789–91).

During his busy public career, the ambitious Hopkinson managed to leave his stamp on the fields of music, art, and literature. His "My Days Have Been So Wondrous Free" (1759) probably represents the first American composition of secular music; his "Temple of Minerva" (1781), the first American attempt at opera. In art, he was noted particularly for his crayon portraits and his work on heraldic emblems. But his literary attainments surpassed all his others.

Between 1757 and 1773, Hopkinson contributed numerous poems and essays, many of them in a humorous and satirical vein, to various periodicals. The following year, he began advancing the patriot cause. A profusion of widely read and influential pamphlets, essays, and letters, often presented in an allegorical style, derided and ridiculed the British and the Loyalists, outlined colonial grievances, and encouraged the colonists. *The Prophecy*, written in 1776 before the adoption of the Declaration of Independence, predicted that event. After the war,

Hopkinson continued to treat political and social themes, and became one of the best known writers in the United States.

While a Federal circuit judge, Hopkinson died in Philadelphia at the age of 53. He was laid to rest in Christ Church Burial Ground. Surviving him were his widow and five children.



Richard Henry Lee

VIRGINIA

Richard Henry Lee, brilliant orator and fiery Revolutionary leader, introduced the independence resolution in the Continental Congress, served for awhile as its President, and later became a U.S. Senator. Fearing undue centralization of power, he fought against the Constitution and led the campaign that brought inclusion of the Bill of Rights. Throughout his life, he strenuously opposed the institution of slavery. He and Francis Lightfoot Lee were the only brothers among the signers.

Fifth son and seventh of 11 children, Lee was born in 1732 along the Potomac shore at Stratford Hall. His initial tutorial education was supplemented by extensive study at Wakefield Academy, in Yorkshire, England, and a tour of northern Europe. He sailed home about 1751 at the age of 19, the year after his father's death, and resided with his eldest brother Philip Ludwell at Stratford Hall. In 1757 Richard Henry married. About this time, he began building and soon occupied Chantilly, about 3 miles to the east on land leased from his brother. In 1768 Richard Henry's wife died, leaving four children; the next year, he remarried, a union that yielded five more offspring.

Lee meantime, following family tradition, had committed himself to politics. In 1757, at the age of 25, he became justice of the peace for Westmoreland County. The following year, he moved up to the House

of Burgesses and sat there until 1775. One of the first to oppose Britain, he early allied with Patrick Henry. As a protest against the Stamp Act (1765), Lee drew up the Westmoreland Association (1766), a nonimportation agreement signed by some of the citizens of his county. The next year, he denounced the Townshend Acts. And a year later he proposed in a letter to John Dickinson of Pennsylvania that the individual colonies set up committees to correspond with each other—an idea that did not come to fruition for 5 years.

In 1769, when Lee and Henry penned an address to the King protesting several actions of Parliament, the Royal Governor disbanded the House of Burgesses. Lee thereupon met with other patriots at Raleigh's Tavern and helped frame the Virginia Association, a nonimportation agreement. Many other colonies formed similar associations, but in 1770 Parliament repealed most of the duties and the protest spirit subsided.

In March 1773, when anti-British feeling flared once again, Lee, Henry, and Jefferson, who had entered the House of Burgesses in 1769, organized a Virginia committee of correspondence and invited the other colonies to do likewise. Learning of the British closing of Boston Harbor in May 1774, they persuaded their colleagues to declare, as a protest, a day of fasting and prayer. The Royal Governor again dissolved the burgesses. The Revolutionaries reconvened at Raleigh's Tavern, drew up a new nonimportation agreement, and resolved to appeal to the other colonies for an intercolonial congress. But, before such action could be taken, Virginia received an invitation from Massachusetts to send representatives to a congress to be held in September at Philadelphia—the First Continental Congress. Virginia's first provincial assembly met in August and designated seven Delegates, including Lee and Henry.

Lee's outstanding congressional act was the introduction on June 7, 1776, of the resolution for independence from Britain, seconded by John Adams. This document, Lee's condensed redraft of one forwarded him by a convention that had met in Williamsburg on May 15, proposed severing relations with Britain, the forming of foreign alliances, and preparation of a plan for confederation. On June 13, or 2 days after a committee was appointed to draft the Declaration, Lee journeyed back to Virginia, apparently because of illness in the family. He did not return and sign the Declaration until sometime subsequent to the formal

ceremony on August 2. Like his brother Francis Lightfoot, in 1777 he also subscribed to the Articles of Confederation. After 1776, however, his influence in Congress waned, and 3 years later ill health forced his resignation.

As a State legislator (1780–84) Lee joined the conservative faction, which represented the interests of the large planters. A Member of Congress again in the period 1784–89, he served in 1784–85 as its President. In 1787, though elected to the Constitutional Convention, he refused to attend and led congressional opposition to the Constitution, especially because of the absence of a bill of rights. Although he was well aware of the deficiencies of the Articles of Confederation, he and others feared a stronger Central Government. Lee's "Letters of the Federal Farmer to the Republican," the collective title for two pamphlets outlining his objections to the Constitution, epitomized antifederalist sentiment.

In 1789 Lee entered the U.S. Senate, but because of failing health resigned in 1792, the year after the Bill of Rights was incorporated into the Constitution. He died in 1794, aged 62, at Chantilly. His grave is in the Lee family cemetery near Hague, Virginia.

Source: The Project Gutenberg EBook of *Signers of the Declaration*, by Various



A Tropical Intermezzo

The Project Gutenberg EBook of Leaves from *the Diary of an Impressionist*, by Lafcadio Hearn

The broken memory of a tale told in the last hours of a summer's night to the old Mexican priest by a dying wanderer from the Spanish Americas. Much the father marvelled at the quaintness of the accent of the man? which was the quaintness of dead centuries...

Now the land of which I tell thee is a low land, where all things seem to have remained unchanged since the beginning of the world,--a

winterless land where winds are warm and weak, so that the leaves are not moved by them,--a beshadowed land that ever seemeth to mourn with a great mourning. For it is one mighty wold, and the trees there be all hung with drooping plants and drooling vines, and dribbling mossy things that pend queerly from the uppermost branchings even to the crankling roots. And there be birds in that wold which do sing only when the moon shineth full,--and they have voices, like to monks,--and measured is their singing, and solemn, and of vasty sound,--and they are not at all afraid. But when the sun shineth there prevaieth such quiet as if some mighty witchcraft weighed upon the place; and all things drowse in the great green silence.

Now on the night of which I tell thee, we had camped there; and it seemed to me that we might in sooth have voyaged beyond the boundaries of the world; for even the heavens were changed above us, and the stars were not the same; and I could not sleep for thinking of the strangeness of the land and of the sky. And about the third watch I rose and went out under those stars, and looked at them, and listened to the psalmody of the wonderful birds chanting in the night like friars. Then a curious desire to wander alone into the deep woods came upon me.--_En chica hora Dios obra_!--In that time I feared neither man nor devil; and our commander held me the most desperate in that desperate band; and I strode out of the camp without thought of peril. The grizzled sentry desired to question me;--I cursed him and passed on.

And I was far away from the camp when the night grew pale, and the fire of the great strange Cross of stars, about which I have told thee, faded out, and I watched the edge of the East glow ruddy and ruddier with the redness of iron in a smithy; until the sun rose up, yellow like an orange is, with palm-leaves sharply limned against his face. Then I heard the Spanish trumpets sounding their call through the morning; but I did not desire to return. Whether it was the perfume of the flowers, or the odors of unknown spice-trees or some enchantment in the air, I could not tell thee; but I do remember that, as I wandered on, a sudden resolve came to me never to rejoin those comrades of mine. And a stranger feeling grew upon me like a weakness of heart,--like a great sorrow for I knew not what; and the fierceness of the life that I had lived passed away from me, and I was even as one about to weep. Wild doves whirled down from the trees to perch on my casque and armored shoulders; and I wondered that they suffered me to touch them

with my hands, and were in no wise afraid.

So day broadened and brightened above me; and it came to pass that I found myself following a path where the trunks of prodigious trees filed away like lines of pillars, reaching out of sight,--and their branches made groinings like work of arches above me, so that it was like a monstrous church; and the air was heavy with a perfume like incense. All about me blazed those birds which are not bigger than bees, but do seem to have been made by God out of all manner of jewels and colored fire; also there were apes in multitude, and reptiles beyond reckoning, and singing insects, and talking birds. Then I asked myself whether I were not in one of those lands old Moors in Spain told of,--lands near the sinking of the sun, where fountains of magical water are. And fancy begetting fancy, it came to pass that I found me dreaming of that which Juan Ponce de Leon sought.

Thus dreaming as I went on, it appeared to me that the green dimnesses deepened, and the forest became loftier. And the trees now looked older than the deluge; and the stems of the things that coiled and climbed about them were enormous and gray; and the tatters of the pendent mosses were blanched as with the hoariness of ages beyond reckoning. Again I heard the trumpet sounding,--but so far off that the echo was not louder than the droning of the great flies; and I was gladdened by the fancy that it would soon have no power to reach mine ears.

And all suddenly I found myself within a vast clear space,--ringed about by palms so lofty that their tops appeared to touch the sky, and their shadows darkened all within the circle of them. And there was a great silence awhile, broken only by the whispering of waters. My feet made no sound, so thick was the moss I trod upon; and from the circle of the palms on every side the ground sloped down to a great basin of shimmering water. So clear it was that I could perceive sparkles of gold in the sands below; and the water seemed forced upward in a mighty underflow from the centre of the basin, where there was a deep, dark place. And into the bright basin there trickled streamlets also from beneath the roots of the immense trees; and I became aware of a great subterrene murmuring, as if those waters--which are beneath the earth--were all seeking to burst their way up to the sun.

Then, being foredone with heat and weariness, I doffed my armor and my

apparel and plunged into the pool of the fountain. And I discovered that the brightness of the water had deluded me; for so deep was it that by diving I could not reach the bottom. Neither was the fountain tepid as are the slow river currents of that strange land, but of a pleasant frigidness,--like those waters that leap among the rocks of Castile. And I felt a new strength and a puissant joy, as one having long traveled with burning feet through some fevered and fiery land feeleth new life when the freshness of sea-winds striketh against his face, and the jocund brawling of the great billows smiteth his ears through the silence of desolation. And the joyousness I knew as a boy seemed to flame through all my blood again,--so that I sported in the luminous ripples and laughed aloud, and uttered shouts of glee; and high above me in the ancient trees wonderful birds mocked my shoutings and answered my laughter hoarsely, as with human voices. And when I provoked them further, they did imitate my speech till it seemed that a thousand echoes repeated me. And, having left the fount, no hunger nor weariness weighed upon me,--but I yielded unto a feeling of delicious drowsihead, and laid me down upon the moss to sleep as deeply as an infant sleepeth.

Now, when I opened mine eyes again, I wondered greatly to behold a woman bending over me,--and presently I wondered even much more, for never until then had it been given me to look upon aught so comely. Begirdled with flowers she was, but all ungarmented,--and lithe to see as the rib of a palmleaf is,--and so aureate of color that she seemed as one created of living gold. And her hair was long and sable as wing-feathers of ravens are, with shifting gleams of blue,--and was interwoven with curious white blossoms. And her eyes, for color like to her hair, I could never describe for thee,--that large they were, and limpid, and lustrous, and sweet-lidded! So gracious her stature and so wonderful the lissomeness of her, that, for the first time, I verily knew fear,--deeming it never possible that earthly being might be so goodly to the sight. Nor did the awe that was upon me pass away until I had seen her smile,--having dared to speak to her in my own tongue, which she understood not at all. But when I had made certain signs she brought me fruits fragrant and golden as her own skin; and as she bent over me again our lips met, and with the strange joy of it I felt even as one about to die,--for her mouth was--

['Nay, my son,' said the priest, preventing him, 'dwell not upon such

things. Already the hand of death is on thee; waste not these priceless moments in speech of vanity,--rather confess thee speedily that I may absolve thee from thy grievous sin.']

So be it, _padre mio_, I will speak to thee only of that which a confessor should know. But I may surely tell thee those were the happiest of my years; for in that low dim land even Earth and Heaven seemed to kiss; and never did other mortal feel the joy I knew of, love that wearies never and youth that passeth never away. Verily, it was the Eden-garden, the Paradise of Eve. Fruits succulent and perfume were our food,--the moss, springy and ever cool, formed our bed, made odorous with flowers; and for night-lamps we prisoned those wondrous flies that sparkle through darkness like falling stars. Never a cloud or tempest,--no fierce rain nor parching heat, but spring everlasting, filled with scent of undying flowers, and perpetual laughter of waters, and piping of silver-throated birds. Rarely did we wander far from that murmuring hollow. My cuirass, and casque, and good sword of Seville, I allowed to rust away; my garments fell into dust; but neither weapon nor garment were needed where all was drowsy joy and unchanging warmth. Once she whispered to me in my own tongue, which she had learned with marvelous ease, though I, indeed, never could acquire hers: 'Dost know, _Querido mio_, here one may never grow old?' Then only I spake to her about that fountain which Juan Ponce de Leon sought, and told her the marvels related of it, and questioned her curiously about it. But she smiled, and pressed her pliant golden fingers upon my lips, and would not suffer me to ask more,--neither could I at any time after find heart to beseech her further regarding matters she was not fain to converse of.

Yet ever and anon she bade me well beware that I should not trust myself to stray alone into the deep dimness beyond the dale of the fountains: '_Lest the Shadows lay hold upon thee_', she said. And I laughed low at her words, never discerning that the Shadows whereof she spake were those that Age and Death cast athwart the sunshine of the world.

['Nay, nay, my son,' again spoke the priest; 'tell me not of Shadows, but of thy great sins only; for the night waneth, and thine hour is not far off.']

Be not fearful, father; I may not die before I have told thee all.... I have spoken of our happiness; now must I tell thee of our torment--the strangest thing of all? Dost remember what I related to thee about the sound of the trumpet summoning me? Now was it not a ghostly thing that I should hear every midnight that same summons,--not faintly as before, but loud and long--once? Night after night, ever at the same hour, and ever with the same sonority, even when lying in her arms, I heard it--as a voice of brass, rolling through the world. And whensoever that cursed sound came to us, she trembled in the darkness, and linked her arms more tightly about me, and wept, and would not be comforted till I had many times promised that I should not forsake her. And through all those years I heard that trumpet-call--years, said I?--nay, _centuries_ (since in that place there is not any time nor any age)--I heard it through long centuries after all my comrades had been laid within their graves.

[And the stranger gazed with strange inquiry into the priest's face; but he crossed himself silently, and spoke no word.]

And nightly I strove to shut out the sound from my ears and could not; and nightly the torment of hearing it ever increased like a torment of hell--ay de mit_ nightly, for uncounted generations of years! So that in time a great fury would seize me whenever the cursed echoes came; and, one dark hour, when she seemed to hear it not, and slept deeply, I sought my rusted blade, and betook me toward the sound,--beyond the dale of fountains--into the further dimness of swaying mosses,--whither, meseems, the low land trendeth southward and toward those wan wastes which are not land nor water, yet which do quake to a great and constant roaring as of waves in wrath.

[A moment the voice of the aged man failed him, and his frame quivered as in the beginning of agony.]

Now I feel, padre, that but little time is allotted me to speak. I may never recount to thee my wanderings, and they, indeed, are of small moment.--Enough to tell thee that I never again could find the path to the fountains and to her, so that she became lost to me. And when I found myself again among men, lo! the whole world was changed, and the Spaniards I met spake not the tongue of my time, and they mocked the quaintness of my ways and jibed at the fashion of my speech. And

my tale I dared tell to none, through fear of being confined with madmen, save to thee alone, and for this purpose only I summoned thee. Surely had I lived much in this new age of thine men must have deemed me bereft of reason, seeing that my words and ways were not like unto theirs; but I have passed my years in the morasses of unknown tropics, with the python and the cayman,--and in the dark remoteness of forests inhabited by monstrous things,--and in forgotten ruins of dead Indian cities,--and by shores of strange rivers that have no names,--until my hair whitened and my limbs were withered and my great strength was utterly spent in looking for her.

'Verily, my son,' spake the confessor, 'any save a priest might well deem thee mad,--though thy speech and thy story be not of to-day. Yet I do believe thy tale. Awesome it is and strange; but the traditions of the Holy Church contain things that are not less strange: witness the legend of the Blessed Seven of Ephesus, whose lives were three hundred and sixty years preserved that the heresy concerning the resurrection of the flesh might be confounded forever. Even in some such way hath the Lord preserved thee through the centuries for this thine hour of repentance. Commend, therefore, thy soul to God, repentingly, and banish utterly from thee that evil spirit who still tempts thee in the semblance of woman.'

'Repent!' wonderingly spake the wanderer, whose great black eyes flamed up again as with the fires of his youth; 'I do not repent, I shall never repent,--nor did I summon thee hither that thou shouldst seek to stir me to any repentance.--Nay! more than mine own soul I love her,--unutterably, unswervingly, everlastingly! Aye! greater a thousand fold is my love of her than is thy hope of heaven, thy dread of death, thy fear of hell.--Repent--beyond all time shall I love her, through eternity of eternities,--aye! as thou wouldst say, even _por los siglos de los siglos_.'

Kneeling devoutly, the confessor covered his face with his hands, and prayed even as he had never prayed before. When he lifted his eyes again, lo! the soul had passed away unshriven;--but there was such a smile upon the dead face that the priest marveled, and murmured, with his lips: '_Surely he hath found Her at last_'--Faintly, with the coming of the dawn, a warm south wind moved the curtains, and bare into the chamber rich scent of magnolia and of jessamine and of

those fair blossoms whose odor evoketh beloved memory of long-dead bridal-mornings,--until it seemed that a weird sweet Presence invisible had entered, all silently, and stood there even as a Watcher standeth. And all the East brightened;--and, touched by the yellow magic of the sun, the vapors above the place of his rising formed themselves into a Fountain of Gold.



Country Dances, Songs, And Legends

Project Gutenberg's *Peeps at Many Lands: Portugal*, by Agnes M. Goodall

The peasants are very fond of dance and song, particularly in Northern Portugal. At harvest-time, and in the month of May, they delight in gatherings where old-fashioned Oriental-looking dances take place. They are slow and sedate, consisting quite as much of movements of the body, arms, and hands, as of the feet, and must have been taken from the Moors. You seldom hear any laughter at these *danças*, though in the ordinary way the northern Portuguese are cheery and light-hearted enough.

The music which accompanies them is also usually of a weird Oriental nature, in a minor key, like many of the national airs and ballads, but each district has its own peculiar songs, and these have often a great charm and sweetness about them, more especially in the mountainous districts, where the Moors never penetrated, and where the peasants retain more of their ancient Roman and Gothic origin.

“When the Portuguese labourer has done his long day’s work, he does not lean against a post and smoke a pipe, nor does he linger in the wine-shop; but if it be a holiday or a Sunday, and in a rural district, he puts on a clean shirt, with a large gold or silver stud as a neck fastening, and his newest hat, varying in shape according to locality, but always of black felt, and of the kind one sees in pictures of Spanish life. He throws over his shoulder a black cloth cloak with a real gold or silver clasp. He takes his favourite ox-goad in his hand, as tall as himself, straight as an arrow, well-rounded, and polished,

and bound with brass. He slings his mandolin round his neck, and makes his way to the nearest fashionable threshing-floor--the peasant's drawing-room. As he passes along, strumming careless chords and humming snatches of strange airs, the girls and lads stop their labour and accompany him, lovers will interrupt their love-making to follow too, or continue their courting to the rhythmic tinkling of the mandolin. When the music and its following arrives at the dancing place, and the partners are all ranged in a circle, the dance will begin, with the strangest, slowest, most old-fashioned steps, the like whereof has not been danced under a civilized roof for centuries. The musician, or the three or four of them whose mandolins make the orchestra, dance in the round with the others, and, when the time arrives, turn and set to their partners like the other dancers."

The above is taken from the writings of an Englishman who spent many years of his life in Portugal, and knew the country well.

There is still a great deal of superstition among the peasants, and some of the quaint legends of vampires, spirits, and fairies in which they firmly believe are most strange. Stories of Moorish maidens are very general. If, wandering through the forests, a man happens to hear an echo of his own voice, he thinks it is that of a Moorish maid, and, being a good Roman Catholic, crosses himself devoutly to keep off harm.

In one place they tell of a huge and terrible dragon, who did all sorts of dreadful things, and terrorized the entire neighbourhood. At last a brave and chivalrous youth set out to try and destroy it, but while he lay in wait for the monster in the heart of a dark wood, he was overcome by sleep, and awoke, to his horror, to find himself in the coils of the monster itself, and the horrible creature in the act of kissing him on the lips. But as it did so the spell was broken, and instead of a dragon, he found he was being embraced by a most beautiful Moorish maiden, with whom he fell in love on the spot, and they were married, and lived happily ever after.

In another place there is a story of one of these maidens whom some wicked spirit had turned into a stone, and quite unconscious of what it really was, a farmer was in the habit of using this particular stone as a weight on his harrow. One day, to his great surprise, he heard a voice in the air above him telling him to break off one corner of the

stone and take it home, and then to throw the rest into a deep pool in the river, which flowed near at hand. He did as he was bidden, and as the stone splashed into the water, he heard a peal of joyful unearthly laughter, as the Moorish maid once more resumed her human form; and on returning to his house the farmer found that the piece of stone he had left there had been changed into pure gold, which made him rich for life.

There is also a great belief in witches--_bruxas_ they call them. The fishermen often think they see them at night on the crests of the waves. They say they are quite accustomed to them, that the lapping of the water is the murmur of their songs, and they are not at all afraid of them, as these water-witches are considered quite harmless. The land _bruxas_ are, however, much more dreaded, and it is strange in a land of otherwise sensible people to hear of the queer customs which are still in vogue, and are supposed to avert the evil they might otherwise do. On May Day a piece of red wool is tied round the necks of all the young animals on a farm: mules, donkeys, sheep, goats, pigs, etc. Old horseshoes are nailed to the house-doors, and a slip of broom is stuck into every stable-door. Every cart, plough, or ox-yoke in the place is also decorated with broom, which is considered particularly efficacious against the dreaded spells of the _bruxas_.

Some animals are looked on as "lucky," particularly the oxen, and the most superstitious peasant will believe himself to be quite safe from all danger of charms or magic when standing among them.

Of all the birds the house-martins are the most cherished, for the legend still survives that they fly to heaven every day to wash our Lord's feet, and it would be thought most unlucky to in any way destroy their nests or young.



Analogies Of Animal And Plant Life.

The Project Gutenberg EBook of *Chambers's Journal of Popular Literature, Science, and Art*, No. 734, January 19, 1878, by Various

The boundary-line between the lowest forms of animal and vegetable life is of a most indefinite character. Nature would seem to have been guilty of many inconsistencies in her arrangement of these organisms; for a being which at one period of its existence exhibits the common characteristics of a plant, may at another period possess the attributes of an animal. Such an organism is found in the form of a fungus which grows on the surface of tan-pits. Under slightly altered conditions it becomes a locomotive creature capable of feeding upon solid matter. Naturalists have therefore always felt a difficulty in deciding which of these doubtful organisms should be classed with the one kingdom and which with the other. Indeed it has been seriously proposed to form a separate class for their reception, a kind of 'no-man's land' to which they might by general consent be relegated.

It would at first appear that a sufficient distinction would be made if such organisms as possess the power of spontaneous movement were at once called animals. But this classification would prove to be most erroneous, for many plants possess the power of movement in a very high degree. The swarm-spores of such algæ as seaweeds, for instance, swim actively about by means of minute filaments or *cilia*. They were on this account long supposed to be animalcules, and it was not until they were found to ultimately develop into the plants from which they sprung, that their real place in nature was determined. These swarm-spores, common enough in the sea and in pools and ditches all the world over, are particles of matter which detach themselves from their parent cells, and after a longer or shorter time of activity, come to rest and form new algæ. They are provided with two or more vibratile *cilia*-minute processes which we more fully alluded to in a recent paper on 'Bell Animalcules.'

The suggestion that animals should be distinguished by their motor powers is also fallacious, for the reason that many animals do not possess this power. Sponges, for instance, are organised bodies which remain stationary attached to rocks. But their system of pores and vents, through which a constant circulation is maintained, and by means of which they are supplied with particles of solid matter as food, most

certainly entitle them to be ranked as animals.

The similarity between the lowest organisms of the two kingdoms does not seem so extraordinary after all, when by the help of the microscope we examine their structural details. In both we find a similar semi-fluid matter called protoplasm, which has been defined as 'the physical basis of life.' In the cellular tissues of many plants this fluid may, with a sufficiently high magnifying power, be seen in a state of ceaseless activity. It is composed of four elements, namely carbon, hydrogen, oxygen, and nitrogen. An analogous substance is found in white of egg, and protoplasm itself is one of the constituents of blood. Many of our readers will know that the colour of blood is due to innumerable red bodies called corpuscles, so minute, that myriads will be contained in one drop of the vital fluid. But there are also other corpuscles quite devoid of colour. These are minute particles of protoplasm, and like the same matter in plants, they exhibit peculiar phenomena of motion, allied to those seen in the *Amœba* or 'Proteus-animalcule.' We may therefore conclude that the vital principle in both animals and plants is the same, and that the tissues of both are built up of this protoplasm; the point of difference being that, whereas animals obtain it ready-made from plants, the latter are the manufacturers of it from mineral or inorganic sources.

There are of course, besides the mere chemical constituents of protoplasm, other conditions necessary to vitality. A certain range of temperature would seem to be the most important, if we except perhaps the presence of water, without which life can hardly exist. But even here a curious exception is presented to us in the Rotifera or wheel-animalcules--formerly alluded to in this *Journal* in an article on 'Suspended Animation'--which may be kept in a state of dried dust for many years, and which, on the addition of a drop of water, will resume their original vigour and rapid movement. The so-called mummy-wheat which is said to germinate after a burial of some thousands of years, is an instance of this retention of the life-principle in plants. Light as well as heat also plays an important part in the mystery of vitality, although it is a curious but well-authenticated fact that the mere growth of plants is most rapid in darkness. We may see an instance of this in the stems of a growing plant which is placed near a window. They will all be bent towards the glass. Hence it is a common saying that they are attracted by the light. But the real reason

for this bent form is, that their darker side grows more rapidly than the rest of the plant, forcing it to assume a curved form.

It is in the nature of their food that plants and animals shew the most marked points of difference. We may state as a broad rule that all living things have the power of taking in foreign matter, wherewith to supply and replenish their various parts. This process, in which the many units which make up the structure are constantly dying away and being reproduced, constitutes what we call growth. In carrying out this function, animals convert organic into inorganic matter, whilst plants do precisely the reverse. They may both be described as digesting their food--if we accept as a definition of the term digestion, that process by which insoluble food is reduced to a soluble form fitted for absorption. In the animal this process is performed by means of glands or their analogues in lower animals, which open upon the internal surface of the stomach, and which secrete an acid fluid called the gastric juice. This fluid contains pepsine--a dried preparation of which, obtained from the stomach of the pig, forms a valuable remedy in the treatment of indigestion. Its power of dissolving organic matter is so subtle, that even after death it may act upon the stomach itself, as well as upon any of the other organs with which it may come in contact. The problem as to why the stomach is during life preserved from destruction by its own secretion, was long a puzzle to physiologists; but it has been decided according to one opinion, that the alkalinity of the blood, which constantly circulates through the tissues, protects them from injury by its neutralising influence.

In plants the function of digestion is the same in principle, although the absence of a mouth and special digestive organs renders it different in detail. Plants require inorganic matters for support. Potatoes and turnips will, for instance, withdraw immense quantities of alkaline matter from the soil. Beans and peas will rob the ground in like manner of its lime, while the various kinds of grasses will choose silica for their nourishment. It is this selective property of plants which renders necessary the rotation of crops. A succession of alkaline plants would in time render the ground quite unproductive of vegetation of that kind; but if a proper rotation of crops be observed--the soil, whilst giving up one of its constituents, is gradually regaining those which it has previously lost. A consideration of these conditions of agriculture forms the very groundwork of scientific farming.

Exceptions to the rule that plants consume inorganic matter are furnished by certain fungi and also by the insectivorous plants. One of these latter, the *Dionæa muscipula*, or Venus's flytrap, we fully described some months ago; but the subject is so replete with interest that we shall not hesitate to recur to it and to refer to some of the other members of the same family.

Without reproducing our description of the *Dionæa*, we may assist our readers' memory by shortly stating that the leaf of the plant is formed of two lobes joined by a midrib, and that each half of the leaf is furnished with three sensitive hairs. On a fly or other insect settling on the leaf and so irritating these hairs, the two lobes gradually close and imprison the intruder. The most remarkable property of the plant is that it not only kills insects in this way, but that it actually *digests* them in a manner exceedingly similar to that by which animals are nourished; for after the prey is secured, a liquid secreted in the upper part of the leaf is exuded, and this liquid is analogous with that furnished in the case of animals by the glands of the digestive mucous membrane. The closeness of the analogy will be better understood by referring to an experiment which was made with a view to testing the solvent powers of this secretion. A slice chipped from a dog's tooth was placed between the lobes of a *Dionæa* leaf. After some days the lobes were separated, and the piece of tooth was found to be in such a soft fibrous condition that it was torn to shreds by the slight force employed in removing it. This energetic power of the secretion will remind the reader of what we have already said regarding the action of the gastric juice upon the animal tissues after death. Another curious point of similarity between the two fluids is observed in the fact that in both cases the secretion is stimulated by the presence of food.

It seems almost incredible to think how such a peculiarity in a plant should have, until very recent years, remained in obscurity. It is true that more than a century ago an English naturalist described it, and submitted his observations to Linnæus. But since that time the matter had aroused very little interest, until some few years ago when Darwin published his wonderful book on Insectivorous Plants. This want of attention is evidently due to the fact that Linnæus himself merely looked upon the plant as one, like the sensitive plant,

having an excitable structure. He regarded the imprisoned insects as merely an accidental occurrence, stating it as his opinion that they were probably released when the leaf re-opened. The matter was thus quietly set at rest by a great authority, and no more was heard of the *Dionæa* until an able naturalist of North Carolina, where the plant is indigenous, again called attention to it.

Another plant belonging to this group has several peculiarities which are worthy of notice. We allude to the *Sarracenia*, which is found in the eastern states of North America. This plant grows in bogs and similar moist neighbourhoods. The leaf consists of a trumpet-shaped tube half covered with an arched lid. This tube exhibits a smooth and slippery surface for some distance down its interior; but lower still it is studded with bristles, its lowest depths being filled with a fluid of intoxicating properties. Round the mouth of the pitcher thus formed exude drops of a sweet viscid fluid. The *Nepenthes* form another branch of the family of Pitcher-plants, including many different species. Indigenous to the Asiatic Archipelago, their appearance is that of a half-shrubby climbing plant, the leaf of which terminates in a long stem, to which is attached a hanging pitcher. These pitchers vary in length from an inch to a foot, or even more; indeed some are large enough to entrap a bird or small quadruped. Their structure is not so complicated as those of the *Sarracenia*, although in other respects they greatly resemble them; while in both cases the digestive functions are closely allied with those of the *Dionæa*. But the most seductive of all these traps for unwary insects is certainly the *Darlingtonia*. Its victim is first of all attracted by the bright colour of its petals, and after it has settled upon the plant, and helped to fertilise it by the movement of its body against the pollen, it slips into a treacherous pitcher, to be first intoxicated, and then totally annihilated. Surely there will be no difficulty in finding an analogy here to certain social institutions belonging to the higher order of animals!

The electrical phenomena common to both plants and animals must next claim our attention. The celebrated Galvani was the first to direct attention to the existence of an electrical current in the muscle of a frog's leg. Volta disputed this, and insisted that the current produced by Galvani was due to certain metallic connections which he employed, and not to any inherent electricity in the muscle itself.

Since Galvani's time, however, numerous investigators have followed up his researches; and it is now an accepted fact that every exertion of muscular force is accompanied by a current analogous to electricity, the strength of which is in exact proportion to the mechanical power called into play. It is a curious fact that this peculiar force remains in the muscle for a certain time after death, but it is totally lost so soon as rigidity sets in, and no earthly power can recall it. It may therefore be considered as essentially a vital phenomenon. It is moreover greater in mammals than in birds, and is least noticeable in reptiles and fishes. But we must not omit to mention that among the latter are found several which have a powerful electric battery as their chief defensive power. The Mediterranean torpedo--one of the Ray or Skate family of fishes--after which our most modern engines of war are named, is the chief of these.

Although it has long been known that currents of electricity existed in plants, such currents were attributed to chemical reaction between the external moisture and the internal juices of the plants themselves, and also to atmospheric disturbance. They have therefore hitherto borne very little analogy to the muscular electricity of animals. But very recently the subject has received great attention; in fact the electrical disturbance consequent on the excitation of the leaf of our old acquaintance the *Dionæa*, formed part of the subject of a paper lately read before the Royal Society. The authors of this contribution to our knowledge of a very obscure subject, proved by numerous delicate experiments that the current which accompanied the closure of the leaf in question was in every respect similar to that obtained from the muscles of animals.



The Beetles

The Project Gutenberg EBook of *Half Hours With the Lower Animals*, by Charles Frederick Holder

The beetles are insects having their fore wings thickened to constitute sheaths or covers for the lower pair, used in flight. Their mouths are adapted for biting, and they pass through a complete metamorphosis. There are about ninety thousand species, ranging from minute creatures to huge, lumbering goliaths. When walking the beetle presents a trim appearance, enveloped in a gleaming armor of the highest polish, and often ablaze with metallic tints, but when it flies the elytra, or wing covers, are thrown up, and a pair of soft, silken wings flutter out, stiffen, and bear the beetle away.

The head of the beetle is small and adapted for biting; the digestive apparatus is simple. The most noticeable feature of many are the antennæ, which often are very long and ornamental. The eyes are compound. The legs are strong and powerful. The beetles spend little time in flying, many being flesh eaters and continually searching for game under refuse and in dark places. They lay eggs which are deposited in the ground, or in special cavities made in wood, which hatch into larvæ. In the tiger beetle the larvæ resemble white worms. In the rose beetle they look like grubs. These in time change to helpless pupæ.

The June bug, the beetle which dashes into rooms, blindly charging lights of all kinds, is a familiar example. Its larva is white and very destructive. On my lawn in California the Bermuda grass often turns white, and sections a foot square can be lifted, having been cut off from the roots by this destructive larva of the June bug, which during this stage of its existence lives underground, eating roots and plants of various kinds. For two years this beetle lives a subterranean, marauding life, growing and shedding its skin. It is often considered a complete animal, but at the end of this period it changes into what is called the pupa stage, which does not move; the pupæ are white, soft, helpless creatures which are found around the roots of rose bushes in great number, and which are so appreciated by mocking birds that they and the blackbirds invariably follow me about the garden when I am overturning the soil with the trowel. Finally the pupa changes into the perfect insect.

The larvæ of some of the spring beetles remain in the "grub" stage five years, and are known as wire worms, doing a vast amount of damage. The girdler beetle bores holes in tender limbs of the hickory, then systematically girdles the limb below the eggs, so that by the time the young hatch they have soft, dead wood to feed upon. The bark borer penetrates the bark of trees, and cuts winding tunnels here and there, in which are placed its eggs. Among the most attractive of the beetles are the carnivorous sexton beetles. They find dead bodies with all the skill of a vulture, burrow beneath them and deposit their eggs within the body, where the young feed. The work these beetles accomplish in destroying animals and even burying them renders them valuable scavengers. Among the destructive beetles are the buffalo bugs which have been introduced from Europe; the larva of these is a strange, fuzzy little creature.

The weevils are the bane of the dweller in the tropics. They infest bread, cake, and flour and meal of every kind. Perhaps the most dreaded by the Northern farmer is the potato bug . which plays havoc with potatoes, often ruining the entire crop, the vines being covered by the soft and disagreeable larva, more like a worm than anything else. The diving beetle is an interesting insect, being a flier and a swimmer. Its hind legs are fringed and adapted for swimming. On the fore limb is a sucker, or several, by which the beetle can attach itself to any object. The larva is a ferocious creature, armed with a pair of fierce jaws, with which it attacks small fishes, frogs, tadpoles, and game very much larger than itself.



Santa Fe National Forest

The Project Gutenberg EBook of *Mosaic of New Mexico's Scenery, Rocks, and History*, by Various

The Santa Fe National Forest, with headquarters in Santa Fe, lies directly south of the Carson National Forest on both sides of the Rio Grande and is the center of a region rich in natural resources as well as historic and geologic interests. The two divisions of the Forest contain the high mountains to the east and west in the central section of the state. The Pecos Division to the east of the Rio Grande is the location of the major part of the Pecos Wilderness Area, one of the earliest of such areas to be established.

The Pecos Division is so named because the Pecos River, which later joins the Rio Grande in Texas, heads among its towering mountains in a beautiful alpine basin sometimes called the *_Pecos Horseshoe_*. The Pecos River is one of the state's largest streams and supplies some of its most important irrigation projects. This division of the Forest includes the southern part of the Sangre de Cristo range and was first known as the Pecos River Forest Reserve, established in 1892—the oldest National Forest in the Southwest. The division abounds in clear, cold mountain lakes and streams. Truchas Lakes, Pecos Baldy, Stewart Lake, Spirit Lake, and Lost Lake, as well as many mountain streams, lure not only the fisherman but the hiker and camper to their wilderness beauty.

Twenty-three developed campgrounds and picnic areas located in cool glades are ready for the visitor along roads leading into the Forest from Santa Fe, Pecos, Glorieta, Las Vegas, and other communities. Skiing and winter sports are available at the Santa Fe Ski Basin northeast of Santa Fe; the chair lift operates year around for those who wish merely to view the spectacular scenery. The Pecos Division watersheds of the Santa Fe National Forest, like the eastern section of the Carson, contribute generously to the water flow of the Rio Grande.

Wild game, game birds, and fishing attract visitors at all times of the year, while the golden hues of the aspen in the autumn tempt artists and photographers to record on canvas and film nature's fall colors. A trip just before the winter snows to the aspen country of the Santa Fe National Forest is a must. Ranger stations are located at Santa Fe, Las

Vegas, and Pecos.

West of the Rio Grande are the Jemez Mountains, which form the Jemez Division of the Santa Fe National Forest. The Jemez country is a favorite area for fishermen and hunters. For the sturdy hiker and picnicker, there are hundreds of fascinating points to visit and peaks to climb. Capulin Peak, Dead Man's Peak, Nacimiento Peak, and Cerro Pedernal are a few of the exciting ones. The Jemez country contains the San Pedro Parks Wild Area, northeast of Cuba where San Gregorio Lake is waiting for the fisherman or hiker willing to walk or ride horseback. This section abounds in unique geologic formations—Battleship Rock, Tent Rocks, Teakettle Rock, to name a few.

Eighteen developed camping and picnicking areas welcome the visitor to the Jemez Division. Youth groups also favor the Jemez for their summer camping. Boy Scouts, Girl Scouts, Camp Fire Girls, YMCA, and others have camps adjacent to the Santa Fe National Forest. Timber production, wildlife habitat management, livestock grazing, and watershed protection are among the activities of the Jemez Division, while visitors and travelers enjoy the forest, the streams, and the unique scenery. Ranger stations are at Jemez Springs, Cuba, Espanola, and Coyote.



The Recreations Of The Black Man

The Project Gutenberg EBook of *The West Indies*, by John Henderson

Foremost in the list of a negro's recreations should be placed the game of love. The black man makes love with the persistency of a Don Juan and with the fervour of a Mexican. He learns his first lessons in courtship long before the school-day age is over. Every boy of twelve has his honey girl, just as every coloured man of sixteen has his wife. There is an Arcadian touch in their love meetings—a fascinating rhythm of sensuous art in their songs of passion. The concert platforms and music halls of London have reflected, not incorrectly, many negro love stories; and the large straw hats and white pants and extravagant phraseology may be counted as roughly typical of the costume and poetry of Jamaica. The negro makes love with the natural freedom of a savage,

but the Jamaican negro tempers his love-making with poetic entreaty. I can imagine that the Jamaican loves to hear the sonorous doggerel of his own ecstatic wooing--that he pleads with his mistress as much for his own pleasure as for hers. The black lady listens, and loves to listen, because his extravagant praise appeals to her vanity, and the black lady is as vain as any white daughter of a rich "buccra." It may come as a shock and surprise to most of my readers to learn that the love-sick black man sometimes declares his love by letter. Whether this is always due to bashfulness or to the accident of geographical distance, I know not. But I have been privileged to read one or two impassioned missives duly authenticated as being the love letters of coloured men to dusky belles. They are interesting enough for reproduction here. I obtained them from a copy of a Christmas number of a Jamaican paper--the _Gleaner_ of Kingston.

The first is written by a love-sick native to a Creole widow. It is addressed in full to

"MRS. AGOSTISS R----- .

"I hope you know Valintine is now in season. I will take the pleasure to write you this; my hearth is yours and you are mine, but do you know it. I love you as the bee love the flower. The flower may fade, but true love shall never. My love for you is a love that cannot be fade. You shall be my love here as in heaven for ever. The Rose in June is not so sweet as when two lovers' kisses meet. Kiss me quick and be my honey. I still remain true lover,

"JAMES."

James is an honest and prosperous black man in the mountains of Jamaica. It is pleasant to know that "Mrs. Agostiss" listened to his simple appeal and became "his honey."

The second epistle has a religious flavour. King Solomon is artfully brought forward as a sort of "backer" of the ardent writer's suit:--

“MY DEAR LOVE--At present my love for you is so strong that I cannot express. So I even write that you may see it. It is every man deauty to write a formil letter.

“My pen is bad and my ink is pale, but my love will never fail. King Solomon say that Love is strong as death, and Jealousy is cruel than the grave. Love me little, bear me longer; hasty love is not love at all. This is the first time I sat down to write you about it.

“I love my Dove. Your love is black and ruby--the chefer of ten thousand. You head is much fine gold. You lock are bushy and black as a raven. Your eyes was the eyes in the river, by the rivers of water. Your cheeks as a bead (_i.e._ bed) of spices as sweet flowers. Your lips is like lilies. You hand as gold wring. Your legs as a pillar of marble set upon sockets of fine gold. Your countenance as a Lebanon. Your mouth look to be more sweet. Your sweet altogether.

“I have no more time to write as I am so tired and full time to go to bead. I will now close my letter with love.”

Poor “Garg Plummer” is in a desperate plight indeed. It is to be hoped that his “dear lov” listened to his strong entreaty. But it could not be otherwise. What human woman could resist the following:--

“DEAR LOV--I is wrote you a letter to beg of you to make me your lover, but you is not wrote me again. I is dead of love every day wen you look so hansom I cane (_i.e._ cannot) sleep, cane eat. I dun no how I feel. I beg you to accep af me as your lover. The rose is not sweet as a kiss from you, my lov.

“Do meet me to-night at the bottom gate an give me you love. Miss Lucy toots (_i.e._ teeth) so green I is like one ear of earn, an her eye dem is so pretty. Lard! I wish I never been born. Poor me, Garg (_i.e._ George), I lov Miss Lucy to distraction. Yours truly,

“GARG PLUMMER.

“Answer me sone lov.”

The fourth letter I reprint simply to show how a little greed may kill all the romance of a negro's love. We trace an artificiality in his love passages. It is hoped that his note produced nothing but a silent contempt:--

"I writ to hear from you wether you intend to make me a fool. I is not a puppy show that you think you find any better than me. i witch (wish) to send the yam bed for plantin in your garden, but i do not know wether i will reap the benefit of it."

Number five is honest but unhappy. He is filled with forebodings of evil. The green-eyed monster has claimed him as his very own:--

"MY DEAR JEMIMA--I has not heard from you for dis 2 weeks gorn. Has you forgot de day wen

[Illustration: ROSIE, A JAMAICAN NEGRESS]

you mek me promise to be my true luv? You must know dat I has heard a lot of tings about you which has been sorely disappoint me in you.

"I have heard dat you stan at your gate and talk to a fine dress coachman. I have heard dat you go to church wid him. I have heard dat you am promise to me but you luv him.

GEORGE.

"Many kisses me sweet luv."

The sixth, and last, is a jumble of incomprehensible passion. No doubt the writer knew what he meant, and perhaps the lady was able to interpret the author's meaning. But I do not know whether the average reader will gain much by reading:--

"DEAR ELIZA--I take the liberty of myself to inform you this few lines, hoping you may not offend (_i.e._ be offended), as often is. I had often seen you in my hearts. There are myriads of loveliness in my hearts toward you. My loving intentions were really unto

another female, but now the love between I and she are very out now entirely.

“And now his the excepted time I find to explain to my lovely appearance, but whether if their be any love in your hearts or mind towards me it is hard for I to know, but his I take this liberty to inform you this kind, loving, and affectionate letter.

“I hope when it received into your hand you receive with peace and all goodwill, pleasure, and comforts, and hoping that you might ansure me from this letter with a loving appearance, that in due time Boath of us might be able to join together in the holy state of matremony.

“I hoping that the answer which you are to send to me it may unto good intention to me from you that when I always goine to write you again I may be able to write saying, my dear, lovely Eliza.

“Your affectionate lover, affraied (_i.e._ afraid), J.S.

“Dear Eliza, wether if you are willing or not, Please to sent me an ansure back. Do my dear.”

So much for the black man's love letters.

For an accurate picture of the love scenes you must visit the island of rivers and take your place in one of those quiet corners of the banana field, and wait for George and Jemima, or James and Mrs. Agostiss R----. I cannot describe the scene. Go to Jamaica and see it for yourself. It is enough that I have made public the love letters of six men I have never seen; I will not attempt to deal with the meeting and courting of a black man and his sweetheart, lest, unconsciously, I should travesty a fine poem.

The scenes of the love meetings of the natives of Jamaica are always framed in a rich setting of tropical moonlight, or waving palm trees and flashing fire-flies.

If a negro lover could not be eloquent in the midst of such rare beauty he would be unworthy of the name of man.

Next to love-making, eating and drinking, and then dancing may be counted the recreations of the Jamaican coloured gentleman. Though it cannot with justice be stated that the negro is an excessively large eater, the manner in which he takes his food evidences the keen enjoyment he gets from every meal. There is no question of lack of appetite in a negro when feeding time arrives. Whether the dish before him be fruit or salt fish, or mashed vegetables cooked with fat, the diner attacks his food with the utmost relish. There is great licking of lips, rolling of eyes and heavy munching by strong jaws. Give a negro a meat bone, and when he has done with it the fragments that remain would not be of the slightest service to the hungriest dog. When the native has finished his dish of vegetables he cleans the plate with his fingers and tongue. There is no food wasted in the land of eternal sunshine. Give a black child a dozen mangoes and then watch from a safe distance. Before you have seen the child's manner of eating, you have not realised how juicy a mango really is. With the negro, eating is not an art, but a sensation of concentrated joy. It is very much the same with drinking. He can go an extraordinary length of time without needing any liquid, but when a negro gets the bottle to his lips, quarts disappear at every gulp. No matter whether the drink be water or cokernut juice or rum, the true black man cannot sip. He drinks as much as he can swallow without stopping to take breath, and then he has finished.

A social gathering is never a success in any Jamaican hut or drawing-room unless the assembled guests are given leave to indulge in the pastime of the dance. Dancing is to the black lady what small talk is to her white sister. Indeed, it is infinitely more even than that. Dancing is everything. They dance when they are merry and full of joy, and they dance when they mourn their dead; they dance when they are hungry and when they have feasted. They dance when they are carrying their fruits to the market-place, and they dance as they return with the spoils of their trading. In moments of religious ecstasy their limbs twitch for the relief found in treading the graceful measure, and when great sorrow has fallen on a household, the members dance slowly to express their woe.

Curiously enough their dancing lacks precision; they have not set pieces; no master teaches them "left foot forward, right foot up, twist"; there is no "one two three, hop, one two three, hop" about the

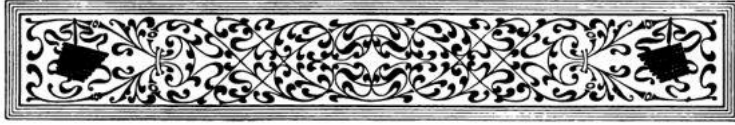
coloured dance, yet it is always perfectly graceful. If there is music so much the better, but if there is no music the dancing goes on just the same. The Jamaicans dance with their legs and bodies and heads; all their limbs are brought into play. The arms wave in sympathy with the active legs, the body bends, the head is thrust forwards and backwards. The whole business is snake-like and fascinating.

Sometimes when a large party is collected, a dance will be arranged to represent some story or history. Biblical pictures are the most popular, and the unrehearsed effect of fifty perspiring negroes, seeking to represent in a ballet the story of Jonah and the Whale,

[Illustration: COUNTRYWOMAN GOING TO MARKET, BARBADOES]

is not without a certain weird and extravagant humour. When the story is of a more bellicose kind—when, for instance, the tableau is that of David and Goliath, the David sometimes overdoes the punishment of the vanquished giant, and there is a little riot caused by the indignation of a too severely-handled artist, who had been persuaded with difficulty to enact the unpopular part. To the black people acting ceases to be make-believe as soon as the dancing begins; David is David, and Goliath is in fact the unhappy giant. So it can be imagined that difficulties frequently arise though there has been no malicious intent, and though the violence may have been born of pure unconscious art.

Sometimes the coloured dancers break into song, and then the bizarre effect is heightened and intensified. The soft, melodious chants of the happy darkies are in perfect keeping with the languorous climate and romantic scenery of the tropical island. The songs are of love and passion. “Ma honey and ma little bird, ma sweet lips and true love” are the usual descriptions of the black man for his mistress. Most of these songs can be heard in the High Street of Kingston, in the early hours of market days when the villagers come down from the country to sell their garden-produce. But the real recreation of the negro is love-making; and all these things, with the exception of the eating and drinking, are simply parts of the game.



Lassen Peak

The Project Gutenberg EBook of *Lassen Trails*, by Stephen Halsey Matteson

Starting Point: Parking lot by Guide Marker 22

Distances: 2.5 miles to top, round trip 5 miles

Topography: 2,000 feet uphill on a steady and rather steep grade (15%), starting at 8,500 feet elevation

Time: 4½ hours, round trip

Features: Scenic views, recent volcanic activity, timberline trees

Although persons of all ages have climbed Lassen Peak, it is not recommended for children under 4, unless carried part way, nor for adults past 70, unless in exceptionally good physical condition. Experienced hikers will find it a comparatively easy hike. But many who climb it are not experienced and may suffer mildly from being winded and from tired muscles and feet. Many people do not allow enough time for the trip. By starting slowly and resting often, most people should be able to reach the summit and experience the thrill of being on “top of the world”.

The mountain Chickadee and Clark’s nutcracker are commonly seen along the trail. The gnarled mountain hemlocks and white-bark pines at timberline, clinging tenaciously to the windswept slopes, are truly picturesque. Views of distant peaks and lakes are magnificent. On the very top, the skunkleaf polemonium blooms profusely in the short, snow-free season.

Take water (snow won’t really quench your thirst) and a sweater or jacket along. If you walk through the craters on top of the peak, use extreme caution. DO NOT SHORTCUT.

In the event a summer thunder storm develops, it is best to turn back. Lightning strikes outstanding projections, and the top of Lassen Peak is a favorite target. Never remain on any mountaintop during a thunder storm.

Leaflets explaining the past geologic history as well as present natural history of the peak are available to make your hike more enjoyable.



First Night In Paris

Project Gutenberg's *A Colored Man Round the World*, by David F. Dorr

My "first day in Paris" commenced at night. If sauce for the goose is sauce for the gander, I will commence this chapter in the day by saying, "where now! valet de place?" "Notre dame," he replied, and the coachman drove away towards the Boulevards. In half an hour's time, he reined before the door of that "Venerable old monument of reality and romance." I approached it like a timid child being baited with a shining sixpence. As my feet touched the sill, a peal came from the belfry, one of those sonorous twangs, that have made so many hearts flinch for hundreds of years in the "Bloody Bastile," and it vibrated from my timid heart to all parts of my frame. At this moment a reverend father offered me his hand, who had all the time been concealed beneath what one might well take to be a dark black coffin standing on end. I accepted his hand, and he led me quietly in that vast "sepulchre of kings."

In all directions I saw magnificent aisles, and altars with burning incense. Magnificent pictures representing all reverend worth, from the "Son of Man," to saints of France. Golden knobs with inscriptions thereon, adorned the footsteps of every visitor thereof, denoting the downwardness of kings who had once ruled nations. Whilst standing there awestruck with departed worth, I gazed downward with a submissive heart, when lo! I stood upon the coffin of a king! I quickly changed my position, but stepped upon a queen. The valet was relating to me the many different opinions the people had about stepping on noted personages, and how unnecessary it was to take notice of such things as they were dead, when I got disgusted at his ignorance, and stepped from a Queen to a Princess.

To describe this gorgeously furnished sanctum, it is enough to say,

that all the brilliant artists of this scientific people have been engaged for hundreds of years in its decoration. Not only employed by the coffers of the Church of France, but by the throne that upheld numerous kings, as well as the wish of the whole populace of France, and the spoils of other nations. Hundreds of people from different parts of the world visit it every day, and all leave a franc or two. Thousands of Parisians visit it every day, and they make no mark of decay. It stands a living monument of Church and State.

Drive me to the national assembly, I said to the coachman. In ten minutes I was going up the gallery. Before I went in, the valet went to a member's coachman, and gave him a franc, and he gave in return a ticket to the gallery. Each member is allowed so many gallery tickets, and if he fails in giving them out, he makes his servants presents of them, and they sell them.

They were debating republican principles. Louis Napoleon was then President of the Republic, and on the door of every building and gate of France were these words in legible letters, "Liberte Egalite Fraternite." Louis Napoleon was not there that day, and they seemed to have a good time, like mice when the cat is away. The most incomprehensible part of their proceeding was, sometimes two would be speaking at once, regardless of the chair. The speaker hammered away furiously, but it was hard to tell, unless you knew, whether he was beating up a revival or a retreat from destruction; as they cooled off their debative heat, there was always twenty or thirty ready to throw agitating fuel in the furnace. As they would cool down a whiff, mushroom-like risings, would be perceptible in four or five different parts of the spacious hall. I could make nothing out of what was going on, save willingness to talk instead of listening, and I left. One handsome and intelligent looking gentleman descended at the same time, which I learned to be the correspondent of the New York Tribune. I then took a curve like tour back, across the Seine, by the Tuilleries, Luxomburg, and back to the same part of the Boulevards, which was more crowded with fashion, than when I passed along in the forenoon, and went home. Night came on, and with it, the gayest time of Paris. The valet said I must go to _Jardin mabeille_, (a ball), I rode there. This is a nightly ball, but there was no less than fifty vehicles of different comforts, which showed that a great many foreigners were there, because Parisians generally prefer promenading

when going to such a feast of pleasure. I paid two francs and went in.

It was a garden about a square block in size. In all parts of it was shrubbery of the most fragrant odors. There was an immense number of little walks, with neat rustic seats for lovers to caress in, from the disinterested eye; and on my first preambulation, I got lost, and intruded more than was polite, but I did not know the importance of this discretion, until I perilously saw the danger. Had I gone on without stopping, I would have led myself to the orchestra, where and when I could have taken part in the amusement to the approbation of all present. When I discovered that I did not know what I was about, I stopped quickly and looked scrutinizingly around those snug little bowers. All in a minute out came a "bower lover," as furious as a cat. I asked him "where the ball was;" he discovered that I was no Frenchman, and could not have meant intrusion; he directed me to go straight ahead, and I left him in his bliss.

Like a round pigeon house on the end of pole, I pronounce the orchestra. A stair ran up to the pigeon house from the platform round the great pole, or post that supported it. A small enclosure was under the orchestra and occasionally the band would descend to the platform to play. Round this orchestra they danced. The spectators seemed to be exclusively foreigners; they made a ring around the gay lotharios as unbroken as the one they made around the orchestra. The bassy and fluty melodious Band, discoursed the sweetest waltz that ever tickled my admiration. Off they glided like a scared serpent, winding their curvy way as natural as if they were taking their chances. There they come! But there is some still going in the ranks, and there is still a vacancy. Twice they have made the circuit, and the hoop is complete. Now to me it is all dizziness, and it all looked to me as a moving body of muses from times of yore. Occasionally my eye would cling to a couple for an instant, but this was occasioned by the contrast between a large, fat, and heavy gentleman, that had become a troublesome neighbor to all that chose to get in his way. Whenever any of the lighter footed would discover their close proximity to his Appollo pedestals, like a shooting star they would flit away, and leave him monarch of all he surveyed.

I wish to describe a few of the most conspicuous, but I will wait for

a quadrille, where I can get them to take their places in description.

The name of my valet de place is Oscar.

"Oscar, what nation does that puny looking, red-skinned man belong to?" "A_Maltese_", said he, as if he never would stop sounding the ese, but he added the "I believe." I afterwards found out that he was some of the Canary Island's stock; but the best of the stock. A beautiful French girl held him by the hind part of his coat with her left hand, whilst she held with her right his hand, lest he might go off in his glee, "half shot." She was also afraid that some interested lady might take better care of him than herself. He was fashionably dressed, and in Paris, as a nabob, His actions represented some rich man's foolish son.

I swear by my father's head, I see a live Turk! Turban! sack hanging between his legs, more empty than Falstaff's! one of the genuine breed that followed Saladin to the plains of Palestine and stood before Richard's battle-axe with his scimitar! one of the head choppers of Christians! Perhaps the next will be the amiable countenance of "Blue Beard." The old Turk and his beard is trying to dance, but his bag won't let him. He is let down, and goes off the track. He is now mixing some oakum with tobacco. Now he is looking on, like a poor boy at a frolic--yes! he would if he could. I am sure his first duty to-morrow will be to hunt a mosque and give up dancing. He is leaving and trying to get his money back.

I walked round on the opposite side, and saw several other incomprehensibles. "What tall, fine looking, yellow skinned man is that, Oscar, with that tall lady standing looking on?" "That, sir," said he, "is a very rich quadroon from Louisiana, I believe New Orleans. He lives at No. 4, _Boulevard Possoniere_, when he is in town, but he has his country residence nine miles in the country. He has a very handsome French lady for a wife, and it is said he left New Orleans on account of their prejudice to color. He is a very popular man here, and is said to be worth \$150,000." Just then I saw Mr. Holbrook, of the New Orleans Picayune, and Mr. Fellowes of the firm of Fellowes & Co., step up to this man and shake him warmly by the hand, and said, "Mr. Cordevoille, don't you know me? I patronized

your tailor's shop five or six years." Cordevoille had been the largest tailorizer in the South, and accumulated a large fortune, and sold out to his partner, Mr. Lacroix, who still is carrying on the firm under the name and style of Cordevoille & Lacroix. Mr. Cordevoille was looking the very picture of a gentleman; he seemed to be a great object of respect to those that spoke to the lady he was conversing with in the French tongue. He reminded me more of Prince Albert in his manners than any other person around. Had his face not been pock marked, he would have conveyed a conception of an inferior Appollo; his tout ensemble had as many brilliant cuts of a true gentleman's conduct, as the single diamond he wore. After some enquiry about New Orleans, he invited some American gentlemen to his country seat; it was to be on the following day, and they being high toned gentlemen of sense, they accepted, not so much for pleasure and information, as for giving Mr. Cordevoille to understand that they understood the duty of gentlemen; no doubt they felt that if they refused, Mr. Cordevoille might feel the weight of such a refusal. They agreed also to stay all night, which invitation had been extended by Mr. Cordevoille. Lest it be a censure on these gentlemen, I refrain from going any further with a subject so delicate.

I now walked under the roof of a very extensive hall; in it was all kinds of refreshments. All one side of the hall was a door, so that when the crowd in the garden was likely to be overtaken by a shower, dancing went on in there. Immense crowds were seated about at tables smoking, and discussing politics, but not one gentleman had his foot on the table, except an American quietly seated in one corner in a profound soliloquy. He was chewing tobacco. I didn't stop to see where he spit, for fear he might claim nationality. I learned that several of the quietly seated, were members of the National Assembly. It was now getting late, and gentlemen that had pretty mates were going through the gates in compact succession. Why gentlemen with pretty mates could not stay to the last was a mystery to me. But to solve that mystery I followed the crowd, and discovered that the nearer they got home, the more affectionate they got.

The most of these couples would stop at the first cafe and call for their tass du coffee and vere d'eau de vie (cup of coffee and glass of brandy). They would set the brandy on fire and burn the

spirits out, and then pour it into the coffee. As soon as they began to feel the effects of this pleasant nourishment, they would move again for home.

At 11 o'clock at night carriages were running in all directions from Balls, Theatres, Operas, Museums, Concerts, Soirees, Dancing Schools, and more amusements than could be named in one article.

I went to the hotel, seeking my own amusement. I could not conjecture a more comfortable place than the house I roomed at, after seeing all this night's bustle. Even if I could not find my own room, I was in the house of acquaintances.

I went to the room of an acquaintance, and talked and lingered in agreeable conversation and amusement until near day. I approached my own chamber, and found that whilst I was out helping to make a city of dissipators, Elvereta had been to my room and arranged my wardrobe _comme foi_. This ends my "first night in Paris."



Early Rising

The Project Gutenberg EBook of *Miss Beecher's Housekeeper and Healthkeeper*, by Catharine E. Beecher

There is no practice which has been more extensively eulogized in all ages than early rising; and this universal impression is an indication that it is founded on true philosophy. For it is rarely the case that the common sense of mankind fastens on a practice as really beneficial, especially one that demands self-denial, without some substantial reason.

This practice, which may justly be called a domestic virtue, is one which has a peculiar claim to be styled American and democratic. The distinctive mark of aristocratic nations is a disregard of the great mass, and a disproportionate regard for the interests of certain privileged orders. All the customs and habits of such a nation are, to a greater or less extent, regulated by this principle. Now the mass

of any nation must always consist of persons who labor at occupations which demand the light of day. But in aristocratic countries, especially in England, labor is regarded as the mark of the lower classes, and indolence is considered as one mark of a gentleman. This impression has gradually and imperceptibly, to a great extent, regulated their customs, so that, even in their hours of meals and repose, the higher orders aim at being different and distinct from those who, by laborious pursuits, are placed below them. From this circumstance, while the lower orders labor by day and sleep at night, the rich, the noble, and the honored sleep by day, and follow their pursuits and pleasures by night.

It will be found that the aristocracy of London breakfast near midday, dine after dark, visit and go to Parliament between ten and twelve at night, and retire to sleep toward morning. In consequence of this, the subordinate classes who aim at gentility gradually fall into the same practice. The influence of this custom extends across the ocean, and here, in this democratic land, we find many who measure their grade of gentility by the late hour at which they arrive at a party. And this aristocratic folly is growing upon us, so that throughout the nation the hours for visiting and retiring are constantly becoming later, while the hours for rising correspond in lateness.

The question, then, is one which appeals to American women as a matter of patriotism, and as having a bearing on those great principles of democracy which we conceive to be equally the principles of Christianity. Shall we form our customs on the assumption that labor is degrading and indolence genteel? Shall we assume, by our practice, that the interests of the great mass are to be sacrificed for the pleasures and honors of a privileged few? Shall we ape the customs of aristocratic lands, in those very practices which result from principles and institutions that we condemn? Shall we not rather take the place to which we are entitled, as the leaders, rather than the followers, in the customs of society, turn back the tide of aristocratic inroads, and carry through the whole, not only of civil and political but of social and domestic life, the true principles of democratic freedom and equality? The following considerations may serve to strengthen an affirmative decision:

The first relates to the health of a family. It is a universal law

of physiology, that all living things flourish best in the light. Vegetables, in a dark cellar, grow pale and spindling. Children brought up in mines are always wan and stunted, while men become pale and cadaverous who live under ground. This indicates the folly of losing the genial influence which the light of day produces on all animated creation.

Sir James Wylie, of the Russian imperial service, states that in the soldiers' barracks three times as many were taken sick on the shaded side as on the sunny side; though both sides communicated, and discipline, diet, and treatment were the same. The eminent French surgeon, Dupuytren, cured a lady, whose complicated diseases baffled for years his own and all other medical skill, by taking her from a dark room to an abundance of daylight.

Florence Nightingale writes: "Second only to fresh air in importance for the sick is light. Not only daylight but direct sunlight is necessary to speedy recovery, except in a small number of cases. Instances, almost endless, could be given where, in dark wards, or wards with only northern exposure, or wards with borrowed light, even when properly ventilated, the sick could not be, by any means, made speedily to recover."

In the prevalence of cholera, it was invariably the case that deaths were more numerous in shaded streets, or in houses having only northern exposures, than in those having sunlight. Several physicians have stated to the writer that, in sunny exposures, women after childbirth gained strength much faster than those excluded from sunlight. In the writer's experience, great nervous debility has been always immediately lessened by sitting in the sun, and still more by lying on the earth and in open air, a blanket beneath, and head and eyes protected, under the direct rays of the sun.

Some facts in physiology and natural philosophy have a bearing on this subject. It seems to be settled that the red color of blood is owing to iron contained in the red blood-cells, while it is established as a fact that the sun's rays are metallic, having "vapor of iron" as one element. It is also true that want of light causes a diminution of the red and an increase of the imperfect white blood-cells, and that this sometimes results in a disease called leucoemia, while all who live

in the dark have pale and waxy skins, and flabby, weak muscles. Thus it would seem that it is the sun that imparts the iron and color to the blood. These things being so, the customs of society that bring sleeping hours into daylight, and working and study hours into the night, are direct violations of the laws of health. The laws of health are the laws of God, and “sin is the transgression of law.”

To this we must add the great neglect of economy as well as health in substituting unhealthful gas-light and poisonous, anthracite warmth, for the life-giving light and warmth of the sun. Millions and millions would be saved to this nation in fuel and light, as well as in health, by returning to the good old ways of our forefathers, to rise with the sun, and retire to rest “when the bell rings for nine o’clock.”

The observations of medical men, whose inquiries have been directed to this point, have decided that from six to eight hours is the amount of sleep demanded by persons in health. Some constitutions require as much as eight, and others no more than six hours of repose. But eight hours is the maximum for all persons in ordinary health, with ordinary occupations. In cases of extra physical exertions, or the debility of disease, or a decayed constitution, more than this is required. Let eight hours, then, be regarded as the ordinary period required for sleep by an industrious people like the Americans.

It thus appears that the laws of our political condition, the laws of the natural world, and the constitution of our bodies, alike demand that we rise with the light of day to prosecute our employments, and that we retire in time for the requisite amount of sleep.

In regard to the effects of protracting the time spent in repose, many extensive and satisfactory investigations have been made. It has been shown that during sleep the body perspires most freely, while yet neither food nor exercise are ministering to its wants. Of course, if we continue our slumbers beyond the time required to restore the body to its usual vigor, there is an unperceived undermining of the constitution by this protracted and debilitating exhalation. This process, in a course of years, renders the body delicate and less able to withstand disease, and in the result shortens life. Sir John Sinclair, who has written a large work on the Causes of Longevity, states, as one result of his extensive investigations, that he has

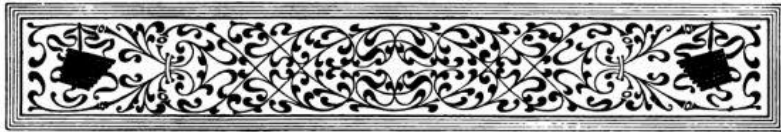
never yet heard or read of a single case of great longevity where the individual was not an early riser. He says that he has found cases in which the individual has violated some one of all the other laws of health, and yet lived to great age; but never a single instance in which any constitution has withstood that undermining consequent on protracting the hours of repose beyond the demands of the system.

Another reason for early rising is, that it is indispensable to a systematic and well-regulated family. At whatever hour the parents retire, children and domestics, wearied by play or labor, must retire early. Children usually awake with the dawn of light and commence their play, while domestics usually prefer the freshness of morning for their labors. If, then, the parents rise at a late hour, they either induce a habit of protracting sleep in their children and domestics, or else the family are up, and at their pursuits, while their supervisors are in bed.

Any woman who asserts that her children and domestics, in the first hours of day, when their spirits are freshest, will be as well regulated without her presence as with it, confesses that which surely is little for her credit. It is believed that any candid woman, whatever may be her excuse for late rising, will concede that if she could rise early it would be for the advantage of her family. A late breakfast puts back the work, through the whole day, for every member of a family; and if the parents thus occasion the loss of an hour or two to each individual, who, but for their delay in the morning, would be usefully employed, they alone are responsible for all this waste of time.

But the practice of early rising has a relation to the general interests of the social community, as well as to that of each distinct family. All that great portion of the community who are employed in business and labor find it needful to rise early; and all their hours of meals, and their appointments for business or pleasure, must be accommodated to these arrangements. Now, if a small portion of the community establish very different hours, it makes a kind of jostling in all the concerns and interests of society. The various appointments for the public, such as meetings, schools, and business hours, must be accommodated to the mass, and not to individuals. The few, then, who establish domestic habits at variance with the

majority, are either constantly interrupted in their own arrangements, or else are interfering with the rights and interests of others. This is exemplified in the case of schools. In families where late rising is practiced, either hurry, irregularity, and neglect are engendered in the family, or else the interests of the school, and thus of the community, are sacrificed. In this and many other matters, it can be shown that the well-being of the bulk of the people is, to a greater or less extent, impaired by this self-indulgent practice. Let any teacher select the unpunctual scholars—a class who most seriously interfere with the interests of the school—and let men of business select those who cause them most waste of time and vexation, by unpunctuality; and it will be found that they are generally among the late risers, and rarely among those who rise early. Thus, late rising not only injures the person and family which indulge in it, but interferes with the rights and convenience of the community; while early rising imparts corresponding benefits of health, promptitude, vigor of action, economy of time, and general effectiveness, both to the individuals who practice it and to the families and community of which they are a part.



Dragon-Fly

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"Dodwell" to "Drama"

(Ger. *Wasserjungfer*; Swed. *trollslända*; Dan. *guldsmed*; Dutch, *scherpstekendevlieg*; Fr. *demoiselle*), the popular English name applied to the members of a remarkable group of insects which formed the genus *Libellula* of Linnaeus and the ancient authors. In some parts of the United States they appear to be known as "devil's darning needles," and in many parts of England are termed "horse-stingers." It is almost needless to say that (excepting to other insects upon which they prey) they are perfectly innocuous, though some of the larger species can inflict a momentarily painful bite with their powerful jaws. Their true systematic position is still contested and somewhat uncertain. By most of the older systematists they were placed as forming part of the heterogeneous order *Neuroptera*. J. C.

Fabricius, however, elevated them to the rank of a distinct order, which he termed *Odonata*; and whatever may be the difference of opinion amongst authors at the present day, that term is almost universally employed for the group. W. F. Erichson transferred all the groups of so-called *Neuroptera* with incomplete metamorphoses, hence including the dragon-flies, as a division of *Orthoptera*, which he termed *Pseudo-Neuroptera*. K. E. A. Gerstäcker more recently also retains them in the *Orthoptera*, terming those groups in which the earlier states are subaquatic *Orthoptera amphibotica*. All entomologists are agreed in maintaining the insects as forming a group marked by characters at once extraordinary and isolated in their nature, and in most modern classifications they are treated as a distinct order.

The group *Odonata* is divided into three families, and each of these again into two subfamilies. The families are the *Agrionidae*, *Aeschnidae* and *Libellulidae* -- the first including the subfamilies *Calopterygina* and *Agrionina*, the second *Gomphina* and *Aeschnina*, and the third *Cordulina* and *Libellulina*.

Anatomy. -- The structure of a dragon-fly being so very remarkable, it is necessary to enter somewhat extensively into details. The head is comparatively small, and excavated posteriorly, connected very slightly with the prothorax, on which it turns almost as on a pivot. The eyes are, as a rule, enormous, often contiguous, and occupying nearly the whole of the upper surface of the head, but sometimes (*Agrionidae* and *Gomphina*) widely distant; occupied by innumerable facets, which are often larger on the upper portion. The antennae, which are smaller in proportion than in almost any other insects, consist only of two short swollen basal joints and a 5 or 6-jointed bristle-like thread. The large labrum conceals the jaws and inner mouth parts. The lower lip, or labium (formed by the conjoined second maxillae), is attached to a very small chin piece (or mentum), and is generally very large, often (*Agrionidae*) divided almost to its base into two portions, or more frequently entire or nearly so; on each side of it are two usually enormous hypertrophied pieces, which form the "palpi," and which are often furnished at the tips with an articulated spine (or terminal joint), the whole structure serving to retain the prey. Considerable diversity of opinion exists with respect to the composition of the mouth parts, and by some authors the "palpi" have been termed the side pieces of the lower lip. The prothorax is

extremely small, consisting of only a narrow ring. The rest of the thorax is very large, and consolidated into a single piece with oblique sutures on the sides beneath the wings.

The abdomen varies excessively in form, the two extremes being the filiform structure observable in most *Agrionidae*, and the very broad and depressed formation seen in the familiar British *Libellula depressa*. It consists of ten distinct segments, whereof the basal two and those at the apex are short, the others elongate, the first being excessively short. In a slit on the under side of the second in the male, accompanied by external protuberances, are concealed the genital organs: on the under side of the eighth in the female is a scale-like formation, indicating the entrance to the oviduct. The tenth is always provided in both sexes with prominent appendages, differing greatly in form, and often furnishing the best specific (and even generic) characters.

The legs vary in length and stoutness, but may, as a rule, be termed long and slender. The anterior pair probably assist in capturing and holding insect prey, but the greatest service all the legs render is possibly in enabling the creature to rest lightly, so that it can quit a position of repose in chase of passing prey in the quickest possible manner. The coxa is short and stout, followed by a still shorter trochanter; the femora and tibiae long and slender, almost invariably furnished on their under surface with two series of strong spines, as also are the tarsi, which consist of three slender joints, the last having two long and slender claws.

The wings are always elongate, and furnished with strong longitudinal neurulation and dense transverse nervules strengthening the already strong (although typically transparent) membrane. In the *Agrionidae* both pairs are nearly equal, and are carried vertically and longitudinally in repose, and the neurulation and membrane are less strong; hence the species of this family are not so powerful on the wing as are those of the other groups in which the wings are horizontally extended in a position ready for instant service. The neurulation is peculiar, and in many respects without precise analogy in other groups of insects, but it is not necessary here to enter into more than some special points. The arrangement of the nervules at the base of the wing is very singular, and slight differences in it form

useful aids to classification. In the *Aeschnidae* and *Libellulidae* this arrangement results in the formation of a triangular space (known as the "triangle"), which is either open or traversed by nervules; but in many *Agrionidae* this space, instead of being triangular, is oblong or elongately quadrate, or with its upper edge partly straight and partly oblique. This fixitude of type in neuration is not one of the least important of the many peculiarities exhibited in these insects.

The internal structure is comparatively simple. The existence of salivary glands, denied by L. Duprix, has been asserted by O. Poletajewa. The rest of the digestive apparatus consists of an elongate canal extending from mouth to anus, comprising the oesophagus, stomach and intestine, with certain dilatations and constrictions; the characteristic Malpighian vessels are stated to number about forty, placed round the posterior extremity of the stomach. Dragon-flies eat their prey completely, and do not content themselves by merely sucking its juices; the harder portions are rejected as elongate, nearly dry, pellets of excrement.

Pairing. But the most extraordinary feature in the economy--one which has attracted the attention of naturalists from remote times--is the position of the genital organs, and the corresponding anomalous manner in which the pairing of the sexes and impregnation is effected. In the male the intromittent organ is situated in a slit on the under surface of the second abdominal segment; it is usually very crooked or sinuous in form, and is accompanied by sheaths, and by external hooks or secondary appendages, and also by seminal vessels. But the ducts of the vessels connected with the testes unite and open on the under surface of the ninth segment; hence, before copulation can take place, it is necessary that the vessels in the second segment be charged from this opening, and in the majority of cases this is done by the male previously to seeking the female. In the latter sex the entrance to the oviduct and genital organs is on the under surface of the eighth abdominal segment. The act of pairing may be briefly stated as follows. The male, when flying, seizes the prothorax of the female with the strong appendages at the extremity of the abdomen, and the abdomen of this latter sex is then curved upward so as to bring the under side of the eighth segment into contact with the organs of the second segment of the male. In the more powerful *Libellulidae*, &c.,

the act is of short duration, and it is probable that polygamy and polyandry exist, for it possibly requires more than one almost momentary act to fertilize all the eggs in the ovaries of a female. But in many *Agrionidae*, and in some others, the male keeps his hold of the prothorax of the female for a lengthened period, retaining himself in flight in an almost perpendicular manner, and it may be that the deposition of eggs and pairing goes on alternately. There is, however, much yet to be learned on these points. The gravid female usually lays her eggs in masses (but perhaps sometimes singly), and the operation may be witnessed by any one in localities frequented by these insects. She hovers for a considerable time over nearly the same spot, rapidly dipping the apex of her abdomen into the water, or at any rate touching it, and often in places where there are no water-weeds, so that in all probability the eggs fall at once to the bottom. But in some of the *Agrionidae* the female has been often noticed by trustworthy observers to creep down the stems of aquatic plants several inches below the surface, emerging after the act of oviposition has been effected; and in the case of *Lestes sponsa*, K. T. E. von Siebold saw the male descend with the female. The same exact observer noticed also in this species that the female makes slight incisions in the stems or leaves of water plants with the double serrated apparatus (vulva) forming a prolongation of the ninth segment beneath, depositing an egg in each incision. He has seen two pairs thus occupied beneath the surface on one and the same stem.

Larva and Nymph. -- The duration of the subaquatic life of a dragon-fly is no doubt variable, according to the species. In the smaller forms it is probably less than a year, but precise evidence is wanting as to the occurrence of two broods in one year. On the other hand, it is certain that often a longer period is requisite to enable the creature to attain its full growth, and three years have been stated to be necessary for this in the large and powerful *Anax formosus*. Like all insects with incomplete metamorphoses, there is no quiescent pupal condition, no sharp line of demarcation between the larval and so-called "nymph" or penultimate stage. The creature goes on eating and increasing in size from the moment it emerges from the egg to the time when it leaves the water to be transformed into the aerial perfect insect. The number of moults is uncertain, but they are without doubt numerous. At probably about the antepenultimate of these operations, the rudimentary wings begin to appear as thoracic buddings, and in the full-grown nymph these

wings overlap about one-half of the dorsal surface of the abdomen. In structure there is a certain amount of resemblance to the perfect insect, but the body is always much stouter and shorter, in some cases most disproportionately so, and the eyes are always separated; even in those genera (e.g. *Aeschna*) in which the eyes of the imago are absolutely contiguous, the most that can be seen in the larva is a prolongation towards each other, and there are no ocelli. The legs are shorter and more fitted for crawling about water plants and on the bottom. In the mouth parts the mandibles and maxillae are similar in form to those of the adult, but there is an extraordinary and unique modification of the lower lip. This is attached to an elongate and slender mentum articulated to the posterior portion of the lower surface of the head, slightly widened at its extremity, to which is again articulated the labium proper, which is very large, flattened, and gradually dilated to its extremity; but its form differs according to group as in the perfect insect. Thus in the *Agrionidae* it is deeply cleft, and with comparatively slender side-pieces (or palpi), and strongly developed articulated spines; in the *Aeschnidae* it is at the most notched, with narrow side-pieces and very strong spines; in the *Libellulidae* it is entire, often triangular at its apex, and with enormously developed palpi without spines, but having the opposing inner edges furnished with interlocking serrations. The whole of this apparatus is commonly termed the mask. In a state of repose it is applied closely against the face, the elongated mentum directed backward and lying between the anterior pair of legs; but when an approaching victim is seen the whole apparatus is suddenly projected, and the prey caught by the raptorial palpi; in some large species it is capable of being projected fully half an inch in front of the head. The prey, once caught and held by this apparatus, is devoured in the usual manner. There are two pairs of thoracic spiracles, through which the nymph breathes during its later life by thrusting the anterior end of the body into the air; but respiration is mostly effected by a peculiar apparatus at the tail end, and there are two different methods. In the *Agrionidae* there are three elongate flattened plates, or false gills, full of tracheal ramifications, which extract the air from the water, and convey it to the internal tracheae (in *Calopteryx* these plates are excessively long, nearly equalling the abdomen), the plates also serving as means of locomotion. But in the other groups these external false gills are absent, and in their place are five valves, which by their sudden opening and closing force in the water to the rectum, the walls

of which are furnished with branchial lamellae. The alternate opening and closing of these valves enables the creature to make quick jerks or rushes (incorrectly termed "leaps") through the water,[1] and, in conjunction with its mouth parts, to make sudden attacks upon prey from a considerable distance. Well-developed Aeschnid larvae have been observed to take atmospheric air into the rectum. The lateral angles of the terminal abdominal segments are sometimes produced into long curved spines. In colour these larvae are generally muddy, and they frequently have a coating of muddy particles, and hence are less likely to be observed by their victims. If among insects the perfect dragon-fly may be termed the tyrant of the air, so may its larva be styled that of the water. Aquatic insects and larvae form the principal food, but there can be no doubt that worms, the fry of fish, and even younger larvae of their own species, form part of the bill of fare. The "nymph" when arrived at its full growth sallies forth from the water, and often crawls a considerable distance (frequently many feet up the trunks of trees) before it fixes itself for the final change, which is effected by the thorax splitting longitudinally down the back, through which fissure the perfect insect gradually drags itself. The figures indicate this process as observed in *Aeschna cyanea*.

The Complete Insect.—For a considerable time after its emergence a dragon-fly is without any of its characteristic colours, and is flaccid and weak, the wings (even in those groups in which they are afterwards horizontally extended) being held vertically in a line with the abdomen. By degrees the parts harden, and the insect essays its first flight, but even then the wings have little power and are semi-opaque in appearance, as if dipped in mucilage. In most species of *Calopterygina*, and in some others, the prevailing colour of the body is a brilliant bronzy green, blue or black, but the colours in the other groups vary much, and often differ in the sexes. Thus in *Libellula depressa* the abdomen of the fully adult male is covered with a bluish bloom, whereas that of the female is yellow; but several days elapse before this pulverulent appearance is attained, and a comparatively young male is yellow like the female. The wings are typically hyaline and colourless, but in many species (especially *Calopterygina* and *Libellulina*) they may be wholly or in part opaque and often black, due apparently to gradual oxydization of a pigment between the two membranes of which the wings are composed; the brilliant iridescence, or metallic lustre, so frequently found is no doubt due to interference—the effect of minute

irregularities of the surface--and not produced by a pigment. A beautiful little genus (*Chalcopteryx*) of *Calopterygina* from the Amazon is a gem in the world of insects, the posterior wings being of the most brilliant fiery metallic colour, whereas the anterior remain hyaline.

These insects are pre-eminently lovers of the hottest sunshine (a few are somewhat crepuscular), and the most powerful and daring on the wing in fine weather become inert and comparatively lifeless when at rest in dull weather, allowing themselves to be captured by the fingers without making any effort to escape. Many of the larger species (*Aeschna*, &c.) have a habit of affecting a particular twig or other resting place like a fly-catcher among birds, darting off after prey and making long excursions, but returning to the chosen spot. A. R. Wallace, in his *Malay Archipelago*, states that the inhabitants of Lombok use the large species for food, and catch them by means of limed twigs.

They are distributed over the whole world excepting the polar regions, but are especially insects of the tropics. At the present day about 2200 species are known, dispersed unequally among the several subfamilies as follows: Agrionina, 700 species; Calopterygina, 280; Gomphina, 320; Aeschnina, 170; Corduliina, 130; Libellulina, 600. In Europe proper only 100 species have been observed, and about 46 of these occur in the British islands. New Zealand is excessively poor, and can only number 8 species, whereas they are very numerous in Australia. Some species are often seen at sea, far from land, in calm weather, in troops which are no doubt migratory; the common *Libellula quadrimaculata*, which inhabits the cold and temperate regions of the northern hemisphere, has been frequently seen in immense migratory swarms. One species (*Pantala flavescens*) has about the widest range of any insect, occurring in the Old World from Kamtchatka to Australia, and in the New from the Southern States to Chili, also all over Africa and the Pacific islands, but is not found in Europe. The largest species occur in the *Aeschnina* and *Agrionina*; a member of the former subfamily from Borneo expands to nearly 6½ in., and with a moderately strong body and powerful form; in the latter the Central American and Brazilian *Megaloprepus caerulatus* and species of *Mecistogaster* are very large, the former expanding to nearly 7 in., and the latter to nearly as much, but the abdomen is not thicker than an ordinary grass-stem and of extreme length (fully 5 in. in *Mecistogaster*).

Fossils. Among fossil insects dragon-flies hold a conspicuous position. Not only do they belong to what appears to have been a very ancient type, but in addition, the large wings and strong dense reticulation are extremely favourable for preservation in a fossil condition, and in many cases all the intricate details can be as readily followed as in a recent example. From the Carboniferous strata of Commentry, France, C. Brongniart has described several genera of gigantic insects allied to dragon-flies, but with less specialized thoracic segments and simpler wing-neuration. These form a special group--the Protodonata. True Odonata referable to the existing families are plentiful in Mesozoic formations; in England they have been found more especially in the Purbeck beds of Swanage, and the vales of Wardour and Aylesbury, in the Stonesfield Slate series, and in the Lias and Rhaetic series of the west of England. But the richest strata appear to be those of the Upper Miocene at Oeningen, near Schaffhausen in the Rhine valley; the Middle Miocene at Radaboj, near Krapina in Croatia; the Eocene of Aix, in Provence; and more especially the celebrated Secondary rocks furnishing the lithographic stone of Solenhofen, in Bavaria. This latter deposit would appear to have been of marine origin, and it is significant that, although the remains of gigantic dragon-flies discovered in it are very numerous and perfect, no traces of their subaquatic conditions have been found, although these as a rule are numerous in most of the other strata, hence the insects may be regarded as having been drowned in the sea and washed on shore. Many of these Solenhofen species differ considerably in form from those now existing, so that Dr H. A. L. Hagen, who has especially studied them, says that for nearly all it is necessary to make new genera. It is of great interest, however, to find that a living Malayan genus (Euphaea) and another living genus Uropetala, now confined to New Zealand, are represented in the Solenhofen deposits, while a species of Megapodagrion now entirely Neotropical, occurs in the Eocene beds of Wyoming.

A notice of fossil forms should not be concluded without the remark that indications of at least two species have been found in amber, a number disproportionately small if compared with other insects entombed therein; but it must be remembered that a dragon-fly is, as a rule, an insect of great power, and in all probability those then existing were able to extricate themselves if accidentally entangled in the resin.

See E. de Selys-Longchamps, *Monographie des Libellulidées d'Europe* (Brussels, 1840); *Synopses des Agrionines, Caloptérygines, Gomphines, et Cordulines*, with Supplements (Brussels, from 1853 to 1877); E. de Selys-Longchamps and H. A. L. Hagen, *Revue des Odonates d'Europe* (Brussels, 1850); *Monographie des Caloptérygines et des Gomphines* (Brussels, 1854 and 1858); Charpentier, *Libellulinae europeae* (Leipzig, 1840). For modern systematic work see various papers by R. M'Lachlan, P. P. Calvert, J. G. Needham, R. Martin, E. B. Williamson, F. Karsch, &c.; also H. Tumpel, *Die Geradflügler Mitteleuropas* (Eisenach, 1900); and W. F. Kirby, *Catalogue of Neuroptera Odonata* (London, 1890). For habits and details of transformation and larval life, see L. C. Miall, *Natural History of Aquatic Insects* (London, 1895); H. Dewitz, *Zool. Anz.* xiii. (1891); and J. G. Needham, *Bull. New York Museum*, lxviii. (1903). For geographical distribution, G. H. Carpenter, *Sci. Proc. R. Dublin Soc.* viii. (1897). For British species, W. J. Lucas, *Handbook of British Dragonflies* (London, 1899). For wings and mechanism of flight, R. von Lendenfeld, *S.B. Akad. Wien*, lxxxiii. (1881), and J. G. Needham, *Proc. U.S. Nat. Mus.* xxvi. (1903). For general morphology, R. Heymons, *Abhandl. k. preuss. Akad.* (1896), and *Ann. Hofmus. Wein*, xix. (1904).
(R. M'L.; G. H. C.)

FOOTNOTE:

[1] A similar contrivance was suggested and (if the writer mistakes not) actually tried as a means of propelling steamships.



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